Subject: Re: I need a bit of help....Convol and functions
Posted by James Kuyper on Mon, 02 Oct 2006 14:58:19 GMT
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D.Kochman@gmail.com wrote:
...
> Sum[(-1)^n*cos(n*P(1)*X)*exp(-(2n)^2*P(2)*X), n ->0 to 10] convol
> exp[-X/P(4)]
>
> *whew*
>
> anyways, I've been working through the documentation on convol, and I
> find it a bit cryptic. I have very few clues how to implement this
> function in code. I'm guessing the first portion (the sum portion)
> needs to be recursively defined in a for loop. Is this the case, or is
> their a shortcut with a sigma type function built in?

Normally, TOTAL() would do the job of the Sigma sybol, but the fact that you have to perform a function call to perform the convolution gets in the way of that approach. Loops are indeed the way to go, in this case.

> However, how do I easily convolve the two functions if they are
> functions and not arrays? Should I just go to fourier space?

CONVOL cannot convolve functions as functions, it can only calculate a numerical approximation to the result of the convolution. That means you have to represent the functions you are convolving, for CONVOL, as arrays of function values at specific points. You'll want to use one of the functions as the kernel for the convolution; I'd recommend using which ever one drops off fastest with X. For your function, that depends upon P(2), P(4), n, and the range of X values that you're convolving over.

Fourier space won't allow you to get around this problem, unless you can perform the calculations analytically in that space. Otherwise, all you've done is change from using an array which represents the value of the function at specific points, to using an array which represents the value of the function's fourier transform at specific frequencies.